

REMARKS

Reconsideration of the pending application is respectfully requested on the basis of the following particulars.

1. In the specification

The specification is amended, as shown in the foregoing AMENDMENT TO THE SPECIFICATION, to eliminate reference to the claims. It is respectfully submitted that no new matter is added, as the changes simply correct minor informalities.

Entry of the AMENDMENT TO THE SPECIFICATION is respectfully requested in the next Office communication.

2. In the claims

As shown in the foregoing LIST OF CURRENT CLAIMS, the claims have been amended to more clearly point out the subject matter for which protection is sought.

Claim 1 is amended to incorporate the features of previously presented claims 2, 6, and 13. It is respectfully submitted that no new matter is added, and no new issues are raised, since the changes merely merge the subject matter of previously presented claims.

Claims 2, 6, and 13 are canceled and the subject matter thereof added to amended claim 1.

Claims 7, 18, 20, and 21 are canceled.

Claims 10 and 19 remain canceled.

Claims 3-5, 8, 9, 11, 12, and 14-17 are left unchanged.

Entry of the LIST OF CURRENT CLAIMS is respectfully requested in the next Office communication.

3. Rejection of claims 1-9, 11-18, 20 and 21 under 35 U.S.C. § 102(b) as being anticipated by U.S. publication no. 2002/0093856 (*Baentsch*)

Reconsideration of this rejection is respectfully requested, in view of the amendments to claim 1 and the cancelation of claims 18, 20, and 21, and on the basis that the *Baentsch* publication fails to disclose each and every recited feature of amended claim 1. The remaining claims depend from claim 1, and are therefore patentable as containing all of the recited features of claim 1, as well as for their respective recited features.

By way of review, amended claim 1 includes the features of previously dependent claims 2, 6, and 13. In particular, amended claim 1 requires a smart card chip, comprising a nonvolatile system memory, a Java Card Virtual Machine implemented in the nonvolatile system memory, a nonvolatile application memory, a volatile working memory and a variables memory area reserved for global variables, the variables memory area being reserved in the volatile working memory. The variables memory area is reserved by a Java package implemented in the smart card chip

Further, the variables memory area is accessible only by programs stored in the system memory and the programs may access the variables memory area that can link to the variables memory area, and an export component of the Java package containing the link information required for linking to the reserved variables memory area is not implemented in the smart card chip.

In other words, a smart card chip with a Java Card Virtual Machine and a memory area reserved for global variables is provided such that access to the global variables is simple, fast, and gentle on the chip (specification paragraph [0024]).

According to amended claim 1, a memory area for global variables is reserved in RAM by a specific Java package implemented in the chip, thus providing fast access to the global variables, which is also gentle on the chip (specification

paragraphs [0024], [0045], [0046]). Due to the fact that the variable memories area is reserved by access information directed directly to the working memory, i.e. the RAM, simple access thereto is also ensured (claim 5; specification paragraph [0046]).

Amended claim 1 also indicates that only programs stored in the system memory can access the variables memory area. This is accomplished, as recited in amended claim 1, by allowing the programs to access the variables memory area that can link to the variables memory area, and an export component of the Java package containing the link information required for linking to the reserved variables memory area is not implemented in the smart card chip (specification paragraphs [0047], [0048]). In other words, a postloaded package implemented in EEPROM cannot access the variables memory 18 reserved in RAM, while a preloaded package implemented in ROM can use the reserved variables memory area of the RAM package (specification paragraphs [0047], [0048]).

As a further clarification of these features, according to amended claim 1, the variables memory area is reserved by a Java package that is implemented in the smart card chip, and it is the sole function of this Java package to reserve memory in RAM (specification paragraph [0032]). No substantial changes to the existing Java Card Virtual Machine architecture appear to be necessary to incorporate the Java package recited in amended claim 1 (specification paragraph [0036]).

According to Java Card technology, a program, represented by a Java package, may both provide and access services of another program. In order to technically permit such access, one program accessing the service of another program has to have the possibility to link to the other program. The respective link information is also called export information (specification paragraphs [0009]-[0012]).

According to amended claim 1, since the global variables memory area is reserved by the recited Java package, this package may be interpreted to offer the service of providing memory in RAM to other programs. In order to access this service, the other program has to link to the recited Java package. This, however, is

only possible if the other program has access to the export information of the recited Java package.

According to amended claim 1, this link (or export information) is not implemented in the smart card chip. Consequently, only those programs having alternative access to this link information can link to the variables memory area.

At least the system programs, generally implemented by the issuer of the smart card, and perhaps some other applets called pre-issuance packages also provided by the card issuer, which are linked before the completion of the smart card by means of an "off-card linker" have access to the link information stored in a certain file, called export file (specification paragraphs [0013], [0015]). This export file is not publically accessible.

Applets or programs that are only installed after completion of the smart card, for example, by certain service providers, are linked on the card by means of an on-card linker and do not have access to the link information of the recited Java package, since this link information is, for example, as part of a secret export file, not implemented on the chip. Consequently, these applets or programs do not have access to the recited variables memory area (specification paragraphs [0038], [0049]).

These features are recited in amended claim 1, and are further defined, for example, in dependent claims 3, 8, and 9.

Turning to the *Baentsch* publication, a technique for language verification of a Java card CAP file is provided (abstract). The *Baentsch* publication discloses (in paragraph [0009]) a standard smart card having RAM, EEPROM, and ROM memory areas (of the type also described in paragraph [0003] of the pending specification). As described in detail in the pending specification, paragraphs [0018], [0021], in present Java card implementations, only *local* variables are allocated in RAM, while *static* (i.e. *global*) variables are implemented in EEPROM.

The *Baentsch* publication is silent as to the allocations of local and static variables. The assertion on page 2 of the Office action that static variables are stored in RAM finds no basis in the *Baentsch* publication, and further, since RAM is volatile, it is respectfully submitted that a person having ordinary skill in the art would store any static variables of the *Baentsch* publication in the non-volatile EEPROM or ROM, and not in the volatile RAM, so that the static (global) variables would not be lost when power is interrupted to the RAM.

Further, the assertion on page 2 of the Office action that the claimed “variables memory area” corresponds to any area in RAM that stores variables or parameters misses the fact that the recited variables memory according to amended claim 1 is reserved by a Java package implemented in the smart card chip. The *Baentsch* publication is simply silent as to this feature of amended claim 1.

Additionally, the *Baentsch* publication is further silent as to which programs may access the “any area in RAM that stores variables or parameters” (identified as corresponding to the recited variables memory area of amended claim 1) and which programs cannot access the “any area in RAM that stores variables or parameters.” As discussed above, amended claim 1 specifically defines which programs on the chip may gain access to the recited variables memory area, and which programs may not access the recited variables memory area, and provides the technical mechanism (linking using export component) for doing so.

There is simply no disclosure in the *Baentsch* publication of these features of amended claim 1.

Accordingly, in view of the above discussion, it is submitted that the *Baentsch* publication fails to disclose every feature of amended claim 1, and withdrawal of this rejection is respectfully requested.

As mentioned above, applicants submit that independent claim 1 is patentable and therefore, claims 3-5, 8, 9, 11, 12, and 14-17, which depend from claim 1, are also

considered to be patentable as containing all of the elements of claim 1, as well as for their respective recited features.

4. Rejection of claims 1-9, 11-18, 20 and 21 under 35 U.S.C. § 102(b) as being anticipated by “Proceedings of ACM Sigplan” (*Shaylor*)

Reconsideration of this rejection is respectfully requested, in view of the amendments to claim 1 and the cancelation of claims 18, 20, and 21, and on the basis that the *Shaylor* publication fails to disclose each and every recited feature of amended claim 1. The remaining claims depend from claim 1, and are therefore patentable as containing all of the recited features of claim 1, as well as for their respective recited features.

The features of amended claim 1 are discussed above in detail.

Turning to the *Shaylor* publication, a Java virtual machine architecture for very small devices, such as smart cards which may have no more than 8KB of RAM, 32 KB of non-volatile memory (EEPROM), and 160KB of ROM.

While the *Shaylor* publication appears to disclose the mutable state of static variables stored in RAM, there is no disclosure in the *Shaylor* publication of how the RAM memory area is reserved for such variables, what programs have the ability and/or permission to access the reserved RAM area, and by what mechanism this access is provided or prevented, all of which are specifically recited in detail by amended claim 1, as discussed above.

Since the *Shaylor* publication is silent as to all of these features, a person having ordinary skill in the art would first consult standard specifications, such as the Java Card Runtime Environment Specification (hereafter, “the Specification”), Version 2.2.1 (available at <http://java.sun.com/javacard/specs.html>) in order to answer the above questions of how the RAM memory area is reserved for such variables, what programs have the ability and/or permission to access the reserved RAM area, and by what mechanism this access is provided or prevented.

As regards the basic question concerning the mere possibility of providing transient memory for global variables, the Specification (Chapter 5, page 23) indicates that Java Card does not support the keyword “transient.” According to Java Card technology, transient objects may be reserved in the form of arrays. An array, under Java, represents a dynamically constructed object including a header and a number of fields of the same type. Such a type may represent a certain variable or again another array. That is, an array is necessarily embodied by a rather complex data structure including a large amount of administrative information including the header. A person having ordinary skill in the art, trying to reserve a variables memory area in RAM, would therefore use Java arrays for the purpose of providing transient memory. However, working with Java arrays appears to be much more complicated and consumes more resources than providing access to RAM by information being directly directed to RAM.

Other than the above method of providing transient memory, which itself is not specifically described in the *Shaylor* publication, there is no further discussion of how to reserve a variables memory area in the volatile working memory by a Java package implemented on the smart card chip, as is required by amended claim 1. In fact, since in general, RAM memory management is a task of the operating system, integrating the possibility of reserving global variables in RAM of the *Shaylor* publication according to amended claim 1 would require a redesign of the operating system of the *Shaylor* publication.

Further, there is no discussion in the *Shaylor* publication as to which programs may access the static variables in RAM and which programs cannot access the static variables in RAM. As discussed in detail above, amended claim 1 specifically defines which programs on the chip may gain access to the recited variables memory area, and which programs may not access the recited variables memory area, and provides the technical mechanism (linking using export component) for doing so.

There is simply no disclosure in the *Shaylor* publication of these features of amended claim 1.

Accordingly, in view of the above discussion, it is submitted that the *Shaylor* publication fails to disclose every feature of amended claim 1, and withdrawal of this rejection is respectfully requested.

As mentioned above, applicants submit that independent claim 1 is patentable and therefore, claims 3-5, 8, 9, 11, 12, and 14-17, which depend from claim 1, are also considered to be patentable as containing all of the elements of claim 1, as well as for their respective recited features.

5. Conclusion

As a result of the amendment to the claims, and further in view of the foregoing remarks, it is respectfully submitted that the application is in condition for allowance. Accordingly, it is respectfully requested that every pending claim in the present application be allowed and the application be passed to issue.

Please charge any additional fees required or credit any overpayments in connection with this paper to Deposit Account No. 02-0200.

If any issues remain that may be resolved by a telephone or facsimile communication with the applicants' attorney, the examiner is invited to contact the undersigned at the numbers shown below.

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Respectfully submitted,

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